SUPPLEMENT.

The Mining Journal,

RAILWAY AND COMMERCIAL GAZETTE:

FORMING A COMPLETE RECORD OF THE PROCEEDINGS OF ALL PUBLIC COMPANIES.

No. 1785.—Vol. XXXIX. LONDON, SATURDAY, NOVEMBER 6, 1869. {STAMPED .. SIXPENCE. UNSTAMPED. FIVEPENCE.

Original Correspondence.

IMPROVEMENTS IN BLAST-FURNACES.

SIR,—As you took a great interest in Lurman's Improvements in Blast Furnaces, the results given below will interest your readers.

[COPY]. C. HOLSTE.

Willenhall Furnaces and Collieries, Willenhall, Nov. 2.

The materials worked are our own clay-band ironstones, with a small proportion of blackband or North Staffordshire.

No. 1.—Furnace *without* the improved Lurman's patent hearth:—Ironstone, 1 ton 13 cwts., to 5 barrows of coal, and 1 barrow of coke.

No. 3.—Furnace *with* the improved patent hearth:—Ironstone, 1 ton 18 cwts., to 5 barrows of coal, and 1 barrow of coke.

The pig-iron produced from No. 3, also, is more regular, and rather greyer than from No. 1. No furnace-bars are required. There is also a saving of labour, inasmuch as we only require two men to work the furnace, instead of three men in each turn, pro 27 hours; the wages are 3s. per man per day.

FLETCHER, SOLLY, AND URWICK.

NOTES ON COAL MINING—MONMOUTHSHIRE.

RISCA COLLIERY.

SIR,—This colliery consists of two establishments—the Black Vein pits and the Rock Vein pits. They are situated close to the western valley branch of the Monmouthshire Railway, seven miles from Newport. About 700 persons are employed at and about the collieries. Coal is worked from the pits together to the extent of 750 tons daily. Ironstone in large balls is got from the top and bottom of the Black Vein, though not to a great extent. But ironstone is known to exist in large quantities in the lowest measures, under the Brass seam, this is as yet unworked. There is 4 ft. of mine ground directly above the Brass seam, which is said to produce 12 cwts. of mine per yard. The situation of the collieries is considered a favourable one for the establishment of iron works. In addition to the local supply of ironstone, hematite and Northampton ore for mixing with it could be obtained at a much lower rate than at the large manufacturing concerns in the higher parts of the western valleys, and the exported goods would also have the advantage of light railway charges to Newport. A canal is made from Newport to Crumlin, five miles above Risca, but this does not seem to be greatly used. The Risca Colliery is carried on by Mr. T. W. Rhodes; the principal royalty is leased from Lord Tredegar.

SECTIONS OF THE PRINCIPAL SEAMS FOUND AT RISCA.

1.—ROCK VEIN.—Strong cliff roof. Rock above.				
	Coal	3 ft.	0 in.	
	Band	0	3	
	Coal	1	0	= 4 ft. 3 in.
	Underclay.			
2.—UNDER ROCK SEAM		3 ft.	0 in.	Not worked.
	Strata	160 yards.		
3.—RED VEIN		2 ft.	0 in.	Little worked.
	Clod, parting	1	0	
4.—GREY VEIN		3	0	= 6 ft. 0 in.
	Clod	3	0	
5.—BIG VEIN—Coal, clean		9	0	
	Underclay and strata	20 yards.		
6.—BLACK VEIN—Engine coal		1 ft.	0 in.	
	Top coal	2	0	
	Good coal	6	0	
	Holing	0	3	
	Bed coals (1 ft. each)	2	0	= 19 ft. 3 in.
	Underclay and strata	20 yards.		
7.—BRASS SEAM		1 ft.	6 in.	Mine ground above.
	Fire-clay worked	4	0	

BLACK VEIN PITS.—There is one downcast used for raising coal and for pumps; an upcast, about 20 yards distant from the other, used for the exhaust steam from two underground engines; and the principal air-pit, 400 yards south from the downcast, at which Struvé's ventilating machine is in operation. The downcast pit is 140 yards deep to the Black Vein. There are three engines erected at the top—one 24-inch cylinder winding-engine, with beam on front wall, 5-ft. stroke, cog-wheels 1 to 2, rope-rolls 10 ft. diameter; flat wire-ropes. There are two bands in the pit. About 350 tons of large are raised daily, and 50 tons of mixed coal; nearly the whole of this from the Black Vein. The pumping-engine has two 20-in. horizontal cylinders, 3-ft. stroke, cog-wheels 1 to 3. From the spur-wheel shaft the crank and connecting-rod give motion to a beam below; this beam extends to the pit, the pump-rods are attached to the opposite end. The water is raised from the sump in one column of 160 yards, forcing set, 13-in. ram, 6-ft. stroke. This engine pumps day and night, going on an average about six strokes per minute in summer, and eight strokes per minute in winter. It raises 33 gallons each stroke, and about 1500 tons in 24 hours. Another engine has 21¼-in. cylinder, 5-ft. stroke, beam on wall, one 5-ft. drum; it draws rubbish brought out of the pit up an incline, about 100 yards of perpendicular height: it also pumps water to a pond and feeds the boilers. The same range of boilers supplies these engines and the two engines underground, the steam for the latter is conveyed down in 9-in. pipes. Pressure of steam 40 lbs. The Black Vein coal at present is all got from the dip by an engine-plane; this plane commences about 12 yards east of the pit, is driven to the dip northward 800 yards down: the engine only works as far as 600 yards at present. The coal is got from three east branches, about 200 yards apart; the engine draws five trams each journey, these are lowered into the two upper branches, the lowest branch is a little beyond the termination of the engine-road, on account of a level part occurring, over which the trams will not run with the rope. The top and middle of the plane dips variously from 5 to 8 in. per yard, the lower part about 3 in., and under. The hauling-engine has one 22-in. horizontal cylinder, 3-ft. stroke, cog-wheels 1 to 2, one 8-ft. drum, steel wire-rope 1 in. diameter. The pumping-engine is near the above, it has one 16-in. horizontal cylinder, 2½-ft. stroke, cog-wheels 1 to 3. This engine raises water up the plane in three lifts, going day and night. There are lodge-rooms for the lower sets to deliver into. The bottom lift has 7-in. bucket, rods of red deal 5½ by 3 in.; the middle lift has 8½-in. bucket, rods of red deal 5½ by 3 in.; and the top lift has 10-in. bucket, rods of oak 5 in. square. The rods run upon iron rollers. The bucket-rod works through a stuffing-box at the top of each barrel, and are close-topped lifts. There is also another 6-in. set of pumps, delivering at the top, and takes its water from a spring occurring in the first lift.

The Black Vein is exhausted on the west side of the engine plane. A large tract to the rise of the levels from the pit is also worked out. An airway is maintained on the outside of these workings, near the barrier, leading to the ventilating machine; it forms the return for the first and second east branches. Another airway, parallel with the engine plane on the west side, is the return for the third east branch, and the travelling way for men and horses; it is maintained at about 45 ft. area, but the bottom requires frequent cutting to maintain this size; the rails are laid to remove the material cut to other parts of the mine. In the third east branch, after proceeding on the level 150 yards, a pair of dips are being driven down, nearly north; these are usually 3 yards wide, but sometimes one wide place is driven; out of these dips stalls are driven on each side, north and south. The coal in this, and in all parts of the Black vein, is got on the stall and pillar system, by double stalls 12 yards wide, pillar of coal between 8 yards; the stalls are filled up with the holing and debris from cutting bottom as they are advanced; they are driven about 60 yards in length, and the pillars are then worked back, the excavation and roads being filled up also. The roof of this coal is a loose one, which necessitates the leaving 2 feet of the good coal for a roof in the stalls; this is afterwards partially got in working back; there is 8 feet of coal under this, which is all got, and is uniform in quality. Above the holing (3 inches) the coal is wedged down in successive layers at the partings; when the top coal comes down, the engine coal (of inferior quality) forms the roof. The bottom occasions great trouble also, from pucking, and the roads require re-heightening frequently. Timber is used largely to support the strata above. Clanny lamps are used by the colliers in this seam. The Mueseler lamp has been in use, but the men object to it, and to the Stephenson also, probably from the inferior light it gives compared with the Clanny. Powder is not used at all in working this coal. From the system adopted of stowing up the workings, and driving double stalls, there is rarely any gas to be seen in the workings; this is a material improvement on the old plan of driving single stalls, in operation at the time of the explosion which occurred on Dec. 1, 1860, causing 142 deaths. The double road stalls furnish a much surer mode of ventilation, and it is satisfactory to be able to record that no explosion has occurred in the mine since that disaster, which may be attributed to the causes primarily producing explosions being better understood—that is, the occurrence of accumulations of gas. The explosion in 1860 is thought to have happened in the second east branch down the engine plane, but the explosion seems to have extended over most of the workings, suggesting the opinion that gas prevailed generally in them. The ventilation is considered to have been interrupted by the slackening or stoppage of the ventilating machine, resulting in the accumulation of gas in all the open parts of the mine—the stalls and headings; this may account for the fire being so general in the mine. Any stoppage of the ventilating machine (the current continuing) would soon cause an appearance of gas at the top of the ventilating pit, and for this reason the boilers are placed at some distance from the ventilator. The ventilator does its work satisfactorily, but it is liable to this contingency—that is, an accident to the machine, causing a cessation of ventilation, and accumulations of gas quickly follow. But this objection can be and is provided for in different ways—by duplicate engines, or a separate engine to each cylinder. The furnace has been tried at the upcast pit as a substitute for the ventilator, but the quantity of air did not come up to that obtained by the present method. The ventilator consists of two cylinders, 18 feet diameter, 6 ft. stroke, going constantly from 8 to 9 strokes per minute; area of one piston, 254·4696 feet; 1 stroke gives 3053½ cubic feet of air, 9 strokes equal 27,480 cubic feet per minute, and two cylinders furnish 54,960 cubic feet. There are 16 valve frames—8 for inlet, 8 for outlet; each frame contains 24 valves of 22 by 13-inch area, or 192 inlet valves equal 380 feet area, and 192 outlet valves of the same area. The engine driving the machine has one 18 inch horizontal cylinder, 3 feet stroke, cog-wheels 1 to 4, pressure 40 lbs. The ventilation for the Black Vein workings is stated to amount to 50,000 cubic feet per minute; this is distributed to each of three branches, the larger proportion to the lowest district; the second unites with the first split, to ventilate the upper district of workings.

Referring again to the description of the Black Vein workings, further east of the pair of dips (120 yards) another pair of dips are being driven down from the level, the stalls worked in a similar manner. In this district cross headings are going to the rise, the stalls being similarly driven, a current of air forced up and down each by means of a canvass door on the heading; the dip here is about 3 inches per yard. In the first and second branches the coal is got by cross headings, and stalls from one or both sides of them. The dip here is 6 inches per yard, or more, and the cross headings are driven at a point between level and full rise.

A large amount of water, it will be seen, is pumped from the dip; the water, no doubt, principally comes from the crop, and through the old workings to the present operations. The present price for cutting coal is 2s. 3d. per ton for large; the price has been greatly enhanced by the accidents that have occurred in this seam, which furnishes a strong argument for adopting the most approved means of ventilation and liberal measures in connection with that, so as to avoid accidents, if possible. The Black Vein produces very hard coal; it has the peculiarity—in addition to being an excellent steam coal—of withstanding exposure to the weather for a length of time, and is, therefore, adapted, and much in request, for long voyages and for consumption in distant parts.

THE BIG VEIN.—This seam is only partially worked, and at present the working of it is small; it is stated in the section to be 9 ft. thick, and has a very bad roof and bottom; the stalls are only driven 3 yards wide, and the pillars of coal 4 or 5 yards; when the stalls are driven to their length the timber is withdrawn, and the pillars are partially got, also the Grey vein and Red vein above it, as the pillars are worked back. The working of the Black Vein under this seam is not found to greatly injure the Big seam of coal; this coal is reached by a stone drift driven north from the Black Vein about 120 yards, and is with the others raised at the Black Vein pit.

ROCK VEIN PITS.—These are about 900 yards north of the Black Vein pits, and consist of two downcast pits, 6 yards apart, for coal drawing, and pumps 80 yards deep to Rock Vein, and one upcast about 200 yards from these. The engine winds and pumps water at the same time; it has one 30-in. cylinder, 5-ft. stroke, beam in house; cog-wheels 1 to 2; rope-rolls, 8 ft. diameter; one wire-rope band in each pit. About 350 tons per day are drawn from the Rock Vein. There are two forcing sets of pumps, each from bottom to top of pit, 90 yards column—one 14¼-in. and one 12¼-in. ram, each actuated by a beam connected with the engine spur-wheel shaft; it makes 11 strokes per minute when drawing coal, and pumps also at night. The Rock Vein is got altogether on the long wall system, the roof is excellent, the excavation is stowed up with debris, no gas is produced, candles are used by the colliers; the coal is a good steam producer, and little pit timber is required. There are three hauling engines placed underground—one engine and two boilers are about 200 yards from the pits, the heat and steam from these boilers and engines produce the ventilation for the Rock Vein; it amounts to 12,000 cubic feet per minute, which is considered sufficient for the workings of this seam. The engine named above has one 18-in. horizontal cylinder, 2 ft. 9 in. stroke; cog-wheels 1 to 2; works one close-topped bucket-lift, 14½ in. diameter, 250 yards long, raises water in 12-in. mains from the bottom of the north plane. No coal is got from this plane at present. Another engine, further east, hauls from the slope going north 500 yards, one 16-in. horizontal cylinder, 2 ft. 9 in. stroke; cog-wheels 1 to 2; one drum 5 ft., worked with chain outwards, the trams run back with it; this engine does not pump water. From the bottom of this slope another plane is driven west, 1100 yards in length, rising and falling in that distance. An engine for hauling and pumping is placed at the commencement of this plane; it has two 16-in. horizontal cylinders, 3 ft. stroke; cog-wheels 1 to 2. Two drums, 5 ft. diameter, may be put in or out of gear as required, and draws 12 trams in and out by means of a main and tail chain; the friction of the tail chain on the return sheave at the extremity of this plane is sufficient to work also two pumps, each 7½-in. working barrel, uniting into one main pipe above. The steam is brought in pipes to this engine from the surface, and exhausts into an airway. The dip near the pits is not more than 2 to 3 in. per yard, at the bottom of the slope it becomes flat as it approaches the sinclinal line. The coal brought out as large is again screened at bank, and the small is partly coked in ovens; there are 10 ovens at work, producing 50 tons of coke weekly. There is a manufactory established for fire-bricks; the clay, of excellent quality, is obtained below the Brass seam. An engine for grinding clay, 18-in. cylinder, 4-ft. stroke, beam construction, 40 lbs. pressure; in addition to this, it blows blast for the smiths' fires, works fitting shop lathes, and drives the saw-mill. As an instance of the velocity of air in underground airways, I may mention the travelling way on the west side of the plane in the Black Vein; about 20,000 cubic feet of air per minute will pass through it, which in 42 ft. area would give nearly a velocity of 8 ft. per second; this, according to experiment, is sufficient to blow flame through the gauze of a Davy lamp with the lamp at rest, but in advancing against the current the velocity would be greater. We can imagine an inflammable mixture of gas finding its way into similar situations where lamps are constantly passing, and where it would be of the greatest importance that the explosive currents should not blow through the lamp.—*Nov. 2.*

M. B. GARDNER.

THE SAFETY-LAMP EXPERIMENTS.

SIR,—Your correspondent, "M. E.," surely cannot have read our letter in the Journal of Oct. 23. We would, however, refer him to it again. We stated that the apparatus was not in perfect order at the trial on Sept. 30. We stand to that statement, and it explains away all the nonsense at the commencement of his letter. We cannot conceive how "M. E." makes out that "the general impression" was satisfactory, as there were but two gentlemen there, with the exception of the colliery officials, which latter party did not consider them at all satisfactory, therefore the general opinion can only be that of those two gentlemen; and suppose the experiments had lasted months instead of a few hours, could they have been satisfactory while the apparatus was not in perfect order? The parties who conducted the experiments cannot be responsible for them, because they stated at the time that they were not satisfactory; the responsibility must rest upon those who published them as accurate experiments. We have "upset," to our own satisfaction, the experiments of Sept. 30, and hope to do so to the entire satisfaction of those who bring the Stephenson lamp on the next occasion.

The authorities who have been examined from the earliest date on the Davy lamp—from Sir H. Davy, Buddle, and others—have stated that the lamp would explode if exposed to currents or sudden gusts of air, by whatever means produced, and they devised means to obviate this danger; but our modern M. E.'s, finding that this leaves them but a narrow limit of presumed safety, make, or feign, a dead set against the truth, though confirmed by experiments.

We really cannot see how it is *an odd circumstance* that "the experiments of the committee," &c.—but we must leave this confused sentence as too difficult for our comprehension. Your correspondent admits "there is something bearing on the subject in the Houghton case." It was a case of holing into old workings—practically a blower. He seems very willing to rush into "sweeping assertions." With regard to Cwmamman, we need only refer him to the report of the South Wales Government Inspector (Mr. J. E. Wales) for 1865, where he will find it described as we state. The evidence given at the Pelton Fell inquest will also enlighten "M. E." on that case. Monterrard was a case where there were only 15 men and boys down the pit at night, and all the lamps were found locked and in perfect order. After some months of enquiry two Government Inspectors gave their opinion that the Ferndale explosion originated from the lamps, yet "M. E." will tell us that the accident was never attributed to the failure of the Davy lamp. And, to add to the list given, can "M. E." gives us a better theory for the explosions at Wallsend in 1835, and at Springwell in 1833. Mr. Mitcheson, in his parliamentary evidence, gives another instance at Green Dock, Staffordshire, in 1835, on the evidence of a survivor. The Wallsend explosion, in 1818, was another case on the evidence of a survivor, and, what is remarkable, it was not caused by a *current* of gas, but mostly by a lad going quickly against the air with a hot lamp. How will "M. E." dispose of this? Similar circumstances will produce like results at any time.

There are several more, yet "M. E." will overlook the evidence of eye-witnesses (survivors) in three or four cases, and the strongest evidence in others, and attempt to argue that the Davy lamp is practically safe. This is not worthy of common sense in a case where loss of life and property may ensue. We cannot absolve "M. E." from the charge of making "sweeping assertions," when he says "imperfect ventilation, and the incautious use of gunpowder, have been without doubt the causes of all modern explosions." "Modern," we suppose, will include Houghton, which, he admits, "has some bearing on the subject." On Cwmamman, Ferndale, &c., we refer him once more to the authorities above mentioned. We think ventilation will never be perfect or sufficient in every case to enable us safely to dispense with lamps. The late Mr. T. J. Taylor says:—

"I have long leaned, to the opinion that the majority of great explosions is due to sudden issues of gas pent up in a high state of tension, and against which, therefore, no system of ventilation now in practice can adequately guard."

And the late Mr. Nicholas Wood, in his inaugural address to the North of England Mining Institute, 1852, says:—

"It is now, I may say, almost impossible to conduct the mining operations of this district without having some collieries, or parts of collieries, subject to be overloaded with inflammable air at times, and it is, therefore, of the utmost importance that those parts of the mine should be approached with a perfectly safe lamp, if such a desideratum is attainable. The opinions given before the Committee of the House of Commons, who have just issued their report on the insecurity of the Davy lamp, and the fact that thousands of these lamps are daily used in an inflammable atmosphere, render this an enquiry of vital importance to the safety of the miner, and the security of the property of the coalowner."

True, the Stephenson lamp has been in use 30, or in fact 50, years, and it is said ("M. E.") that no case has been established against it; nevertheless, that is very far from proving its "practical safety." We think we may safely say that the cause of more than one-half of the colliery explosions is never discovered, the calamity destroying the means of finding its true cause; besides, this evidence (if admitted as such) is only negative, and can never prove the safety of this or any lamp. Almost the same thing may be said of the Clanny, which is no safer whatever than the Davy; we say almost, for there was one case in Wales, a few years ago, which could only be attributed to the Clanny. Perhaps this may be further accounted for from the fact that the Stephenson and the Clanny have never been so much used by far as the Davy?

Stress is laid on the fact that manufactured gas is used in the apparatus, which shows, however, that the Lamp Committee have had a little more forethought than "M. E." seems to give them credit for—as a large number of experiments have been made with real mine gas, which, however, does not give widely different results from the ordinary illuminating gas, and the results of the lamp trials are given in gas of this kind. Now, can "M. E." state any conceivable difference between this odious "box" of half a foot area, and an air passage of 30 ft. area.

With regard to submitting a Stephenson to trials "in ordinary working practice," no explosions occur in the ordinary working state of a mine, we presume to believe, with Mr. T. J. Taylor, it is the sudden evolution of extraordinary quantities of gas that causes explosions generally, and we think it difficult—nay, impossible—for any person to prescribe the conditions which may be induced in such extraordinary circumstances; every fresh explosion gives instances of this, and shows how impossible it is to foresee the circumstances which will occur. We should hope its ordinary practice is in an atmosphere free from any harmful mixture of inflammable gas. What it is necessary to provide against are the extraordinary tests which the lamps may be called on to bear; what is the use of a lamp which is only a protection when there is little, or almost nothing, to be defended against, and fails when its security is most wanted. Yet, with a tenacity truly remarkable, "M. E." sticks to the lamp whose explosive limit is proved to be nearest to the most easily exploded one, and ignores those which have so far proved inexplosive, and are 40 times at least safer than his idol.

Your correspondent observes, "with respect to blowers, they are approached very cautiously (if at all)." This is a very smooth way of introducing blowers, and the whole class of sudden outbursts or effusions of gas; but are these blowers, &c., so gentle and cautious in approaching the miners' lamp? That may be quite another thing. No, however we may talk of these occurrences induced in mining, every experienced miner knows how little warning they mostly give. Then, "M. E." ventures on a most startling assertion—"The speed necessary to explode the lamps, and the mixture required, are not met with in mines." Now, we have seen in the cases cited the necessary conditions. The mixture was perfectly inflammable, and, at the same time, the speed, or the necessary agitation of the air, was present; one case, indeed, occurred almost without a natural current, and only by the speed of the lamp. But what is the use of reasoning with anyone who makes such "sweeping assertions," and discards experience and the evidence of the senses, and substantially, or virtually, attributes, contrary to the best authorities, all explosions to a naked light of some kind, if even induced by culpable means?

The letter of "Collier" can hardly be complimented for its accuracy. The Clanny lamp did not go through the test satisfactorily, but exploded at 11½ ft. per second, and but for the imperfection of the mixture of gas would have exploded at 8 ft., as in all former experiments. He might have shown a little more deference to the judgment of the Northern Mining Institute with regard to the merits of the testing apparatus. He seems to admit the unsafety of the Davy lamp, and, therefore, we think he must give up the Stephenson also, as it has only 1 ft. per second additional safety. So far as the comparative unsafety of lamps which have been subjected to rough usage is concerned, it has no foundation in fact, as a Davy that has been used for years is found to be as safe as one fresh from the maker, so that "Collier" would be utterly disappointed in a new lamp, however well constructed. We think nothing can show the unsafety of the Davy lamp more than the fact that it is known to become red-hot in a still mixture of gas, showing how nearly such a small test brings it to its limit of safety.

Your correspondent, "M. E.," by saying "*we* merely published the official account," identifies himself with the unsigned letter and experiments in the Journal of the 16th inst., which, however, seem to bear the stamp of a very different hand. In the Journal of that date he says, "circumstances may, and no doubt have, occurred where an explosion has resulted from the flame of this lamp," the Davy; and we are much obliged to him for his good opinion of our lamp, in which he says, "it is no doubt the best lamp extant, so far as safety is concerned;" and, with regard to its practical qualities, we can assure him that it is giving the greatest satisfaction in many places.

In our opinion, the test applied to the lamps by the North of England Institute is a fair and legitimate one, and a true representation of what mining lamps may be called to bear; and the results they give harmonise with those of experience, and also accord with the philosophy of the question. We think no one, after studying the construction of the present lamps, can be at all strengthened in his opinion of their safety. Correspondents, and those who will argue for the safety of the present lamps, should remember that the least that can be said is, that they are arguing on the dangerous side of the question, and, therefore, it behoves them to exercise very great caution in it. They are arguing for a state of things from which no conceivable good can accrue, and from which, to say the least, they incur the greatest risks. They are making the breaking strain of their cable alarmingly near its working load. We feel assured that whatever can be said on their side of the question will not reduce the inclination of those managers of mines who value really safe lamps from introducing them. WM. HANN AND SON.

ON THE ASSAY OF SILVER ORES.

SIR,—To the English miner there are few subjects which demand more attention than the assay of silver ores, or of argentiferous copper and lead ores, which occur more frequently in this part of the world; but it is also a subject which interests the public more than people are generally aware, and I believe that the few remarks which follow may prove useful in various ways.

In the last number of the Journal there are some paragraphs which have suggested to me the necessity of calling the attention of those interested, or likely to become interested, in argentiferous mines to what the assay of a silver ore really signifies. In one of them I observe a notice of an old Cornish mine, which it is proposed to work again. I may state at once that I know nothing whatever of this mine, and, for aught I can say, it may be a valuable property; but I find it stated that an assayer has found 3000 *ozs. of silver per ton* of ore yielded by it, as the result of his assay. On looking over the paragraph again I see that this incredible result was *not obtained upon a ton of material—i.e.*, from a sample fairly taken out of one ton or more of the ore—but from picked specimens of tetrahedrite or some such silver ore that happens to exist here and there in the said mine, and of which there is, probably, not half a hundredweight in the whole workings.

Now, Sir, allow me to ask you how can anyone (with anything like a conscience), after submitting to analysis a few grains of a comparatively rare mineral—which few grains were, in their turn, obtained probably from less than half an ounce of ore—how can anyone, I say, proclaim that the assay shows 3000 ozs. of silver *per ton*. It is a mistake and a delusion, and would lead investors in mines into the most dreadful errors were they to allow themselves to be guided by such utterly worthless announcements. In order that an assay of silver ore may possess a *bona fide* commercial value—in order that the result may truly indicate the amount of precious metal present in 1 ton of produce—it is absolutely necessary that the sample of ore assayed should be taken from, at least, 1 ton of material—that is to say, from 1 ton of ore broken up and ready for sampling. In such a case, the assay faithfully and truly indicates the quantity of precious metal contained in 1 ton of ore. If the sample be taken from *more* than 1 ton of material so much the better for the cause of truth; but if it be chosen from a *smaller* bulk it cannot, either logically or scientifically, represent the quantity of silver *per ton*. In the latter case, it should be stated that a sample taken fairly from 1, 2, or 3 cwts. (as the case may be) yielded so much *per cent.* of silver. The days are gone by when men could put *an ounce* of ore in their waistcoat pocket, and, after assaying it, proclaim to the world that the ore of such a mine contains from 3000 to 4000 ozs. of silver *per ton*. It is, perhaps, needless to add that no silver ore worked in England or elsewhere yields 3000 ozs. of silver *per ton*, though *per ounce* or *per grain* the quantity of metal in a small picked sample might be in that ratio.

T. L. PHIPSON, Ph.D., F.C.S.,
Member of the Chemical Society of Paris.

Analytical Laboratory, Putney, S.W., Nov. 1.

P.S.—In my next I hope to make a few more remarks on the Assay of Silver Ores. I may take this opportunity to state that the new mineral, thelline or thellite, from San Paolo, in the Brazils, has been lately analysed in my laboratory. It was supposed, from its curious blowpipe reactions, to be a very rare substance, of great price, said to contain silicate of yttria, glucina, &c. I find that it is simply a variety of resinite, containing a little glucina, and will send you a complete account of it shortly. I should not be surprised to find glucina present in many varieties of resinite and in similar minerals,—T. L. P.

NOVA SCOTIA GOLD FIELDS.

SIR,—After reading the "Gold Fields of Victoria"—an elaborate work by the Secretary for Mines for that colony, which the enterprise of Messrs. Trübner and Co., of London, has just introduced to the American continent—one loses much conceit in regard to the present *status* of the gold mines here. At the same time, the conviction obtains ground that there is still scope in Nova Scotia for profitable investment in quartz mining; and that intelligent, persevering search will yet lead to the discovery of paying alluvians. The reason why no English company has been successful in this province is because heavy purchase prices and expensive management have precluded the possibility of profit. The principle acted upon by one of the most popular American promoters is to test his properties well, and only to dispose of them when their productiveness is established. Thus, the Ophir Mine, which sold for 14,000*l.*, yielded an average of 1000*l.* per month from the date of its transfer to the public, but an English operator would have exacted 50,000*l.*, at least, for such a property, and though the price would in no way have affected the future yield it would have long delayed the division of profits. It is not to be supposed that the Americans have picked out all the best claims, or that Englishmen only in this province lack the ability of conducting mining ventures to a satisfactory issue. Distrust and stagnation still continue here, though the results from several districts are of a nature to revive confidence.

SHERBROOKE.—The manager of the Palmerston and Wellington Mines brought up 360 ozs. last week, the united produce of both properties for September. The New York and Sherbrooke Company have revived operations, Mr. Francis Zwickel, the superintendent, having returned from Austria. The Wentworth Company are working on a limited scale.

WINE HARBOUR.—The El Dorado Company report 46¾ ozs., from 185 tons; the Napier Company, 15½ ozs., from 45 tons; the Eureka Company, 18 ozs., from 25½ tons (one lot, of 1 ton 8 cwts., gave 7½ ozs.); and the Globe Company, 9¼ ozs., from 80 tons—all for September.

UNIACKE.—This district, so popular last year, is capriciously abandoned by all but the companies reporting progress, which are—the Montreal Company, 27½ ozs., from 21 tons; the Uniacke Company, 66 ozs., from 150 tons; the Central Company, 9½ ozs., from 5½ tons; the Prince of Wales, 2¼ ozs., from 6 tons; the Queen Company, 1¼ oz., from 7½ tons. The Westlake Company have not cleaned up, and have let the mine on tribute for four months to a furnisher in the district.

TANGIER.—No news from the Harbour, but from the Old Diggings, Mooseland, 800 lbs. of quartz, from a half inch lode, gave 26 ozs. of gold at a recent crushing.

MUSQUODOBOIT.—Since last writing the results from the crushing of 1 ton of the newly-discovered cross lode have been received—22 ozs., which is equal to 24 ozs. 12 dwts. 19 grs. per 2240 lbs. It is expected to hold out for two or three months at this rate; but Mr. Bürkner, who has acquired the right to work the first 60 ft., is limited to six men per day. As related, the property belongs to M. Touquoy (who, by-the-bye, is cited in Mr. Brough Smyth's "Gold Fields of Victoria," as one of the discoverers of Campbell's district in that region), and he has had the good fortune since to find another patch on the same lode, 50 ft. north of the part which he had let, and which promises equally rich returns. This fact, however, has not produced the slightest sensation in the neighbourhood of the mine, or in Halifax. Mr. Bürkner's large lode, on No. 4 shaft, maintains an average yield of 6¼ dwts.; the northern lode, from which returns are wanting, was expected to give 2 ozs. The Hyde property continues under development.

OLDHAM.—While the palm rests with the last-mentioned district, Oldham is not far behind it. Some rich specimens were obtained yesterday from the Richey and Fraser claim, at a depth of 70 feet. The lode is 10 in. wide, and the quartz cannot give less than 8 ozs. per ton. Excellent results have been obtained, too, during the past fortnight from the property of the Sterling Company.

Halifax, N.S., Oct. 21. ——— ACADIENSIS.

IRON MINES IN AUSTRIA—VALUABLE PROPERTY.

SIR,—I consider the discoverers of the gold fields of California and Australia, as well as the writer of the notice in the American Patent Report some years ago, which led the Northerners (Yankee proper) to look at the worn-out red sedge fields of Old Virginia, benefitters of their fellows, because they opened up new sources for enterprise and labour, through which the general weal is furthered. I am following in the same direction by writing this letter to you. I want to tell you what I have seen in this out of the way place in the matter of minerals and mines, which account may put some one who reads it on his mettle, and result, perhaps, in making a neglected district blossom once again; and, as the "labourer is worthy of his hire," pay well all that are concerned in doing it.

I must, first, premise that I am not writing an interested account; indeed, I have just finished a line of railway here, and am about to leave the place altogether; and because of this, I have a desire to let others know what a plum is here to be had for the plucking.

Mr. J. H. Hitchins, of the Devon Great Consols, was out here just a year ago. Some half-dozen gentlemen had clubbed together to a fund to secure his valuable services; and, as illustration of my subject, I shall occasionally make extracts from the report he made upon the matter in hand. The district I wish to draw attention to is situate on the eastern boundary of the Austrian empire—Bukowina, at a point where Moldavia and Wallachi are on the opposite side of the dividing ridge (Carpathians). The immediate locality of the valleys of the Moldowa and Golden Bistroza rivers; area, 35 miles by 15 miles. The whole of this is rich in minerals, water-power, wood fuel, and a product which is destined later to play no small part in the reduction of metals—naptha; and last, not least, cheap labour, and plenty of it. Here, 250 miles from any railway communication, even as late as three years ago, exists a notable iron works, called Jakobeny. Of its extent I cannot do better than give Mr. Hitchins's own description, as follows:—

"The establishments are five—Jakobeny, Poschorita, Kirilbaba, Eisenau, and Freudenthal. The furnaces number 10; the hammer-mills, worked by powerful water-wheels, 34; machinery and other workshops, between 20 and 30; water-wheels, altogether, 70; canals bringing water to the machinery for furnaces and hammer-mills, and floating timber, 4 miles; roads between the several mines and establishments, 120 miles; important buildings for official residences, stores, and other purposes, 80; dwellings for the miners and other workmen, 909; baths, 8 flour-mills, 7; water pumping-engines, 5; calcining kilns, 18; brick yards, 4; charcoal establishments, consisting of 30 places (three forming a party), equal to a production of 3000 tons per year, &c."

And I may add what Mr. Hitchins, perhaps, includes under the abbrevination, &c., half-a-dozen Protestant schools and churches; for be it known that in this district, surrounded on all sides by the Greek and Roman Catholic region, this colony of imported workmen consists almost exclusively of German Protestants, under the direction of the Pastorate of Czernowitz. Mr. Hitchins further says, "These five establishments must have cost over 100,000*l.*, most likely 120,000*l.*" Of my personal knowledge of works here and other parts of Europe, my estimate would be nearer 200,000*l.* The works date from about 60 years ago, and have been in one family all the time from grandfather to grandson. The last two proprietors were essentially spendthrifts and absentees; they bled the works of all available capital, borrowed as much as possible on them by way of mortgage, until the last owner, No. 3, unable to borrow to pay an hotel bill, shot himself dead. The district contains iron, copper, and silver-lead in abundance. My object is to speak about iron, and I will not trouble your readers about the other metals further than to say that what they have once done (and they have done wonders in their time) they will certainly do again. Iron is my forte—I understand its operations, and as a railway man, in a district where we have obtained our iron with difficulty from Austrian works, because of the present demands upon them, I have regretted to see that at least half of the iron for the 1200 kilometres of railways now making in Moldavia comes from Northern Europe with many hundreds of miles of railway and cart carriage directly by a district capable of producing (Mr. Hitchins says) iron "of the best possible description." I have "never seen better," in unlimited quantity.

The iron is all hammered here, and is made to-day at a profit of at least 3 fls. per hundredweight, or 5*l.* sterling per ton—all expenses paid. I make this assertion advisedly—I can prove it. Mr. Hitchins says—

"I have, indeed, in a most particularly minute manner, entered into all the calculations as to breaking the ore in the mine in the first place, getting it out and into the furnaces (carriage, of course, included), the purchase of wood, and making the same into charcoal, cost of lime, superintendence, and labour of every description, repairs, and everything in connection in any way with the conversion of the ore into metal, royalty to be paid, and interest on the outlay, &c., and I find that the expenditure in respect of such matters has been greater than it should have been; indeed, to such an extent, as to admit of a saving worth while to the profits. I have no hesitation whatever in saying that there is the clearest view of 3*l.* 10s. per ton profit."

For a description of the mines themselves, or rather some of them, I cannot do better than again extract from the report; and from what I know of the facts, if Mr. Hitchins has erred at all, it is on the side of caution:—

"MINE ARSCHITA.—Three miles from the furnace; down-hill carriage; depth not exceeding 10 fathoms; the entire thickness of the bed has not yet been ascertained, but it must be very great, some of its best ore-producing portions being 6 to 8 fathoms thick, of good iron-making character; ore average, 18 per cent.—it should be better (say) 20 per cent., and it might be made so. This mine is capable of producing 1920 tons of metal a year."

"AUROTA.—Eight miles from furnace, consisting of large open workings from the surface; same bed as Arschita. This great bed of ore will produce 400 tons to 500 tons of ore a month (1080 tons of metal a year)."

"COLLACA.—There are two, perhaps three, beds of ore in this mine, but the main workings are on the principal one, to which my remarks will be confined, the other two having been but little worked, although what has been done on one of them justifies my saying that it will turn out very well. The thickness of the bed is 15 feet; production equal to 50 tons a fathom—that is, its entire thickness for 6 ft. in length and height; average, 26 per cent. (calcined); 4 tons represent 1 ton of metal, which few important particulars establish the fact that this mine is an undoubtedly valuable one; 300 tons of ore monthly to be obtained, which, being put into the furnace, will bring out 75 tons of metal, or 900 tons a year. Twelve miles from furnace."

"WALESTINA.—The three beds are, in my opinion, to be more correctly considered as one great bed, with intermediate poor layers; be this as it may, the principal bed, 8 to 9 feet thick, will turn out a great deal of ore (35 per cent.); 700 tons of metal yearly."

"RUSSAYA.—Highly mineralised bed of ore, 8 feet thick (magnetic); 45 per cent.; desirable in the furnace with other ores; good supplies to be obtained at once; annual yield, 800 tons of metal. This mine will greatly exceed this when its full power of production is brought into action, having command of this rich bed of ore for more than two miles in extent. Beyond question, Russaya is a very valuable mine."

"PAREU KAILOR.—Twelve miles from furnace; long and expensive level; 300 fathoms driven to reach the bed. There has been a great deal done, the excavation being necessarily large, as the bed is 30 ft. The character and quality of the iron itself is very good, but the bulk (of a large pile at the mine) to send off, will not give a high percentage. Ore enough, with but ordinary force, is to be got from this great bed, to produce 300 tons of metal a year; to save carriage it should be smelted at Poschorita (four miles). There are other iron ore beds, with strong evidence of being more than probably valuable. By the foregoing particulars and estimates, showing the value of *some* of the iron mines comprised within the limits of the very extensive properties of this establishment, it is to be safely inferred—indeed, to be taken for granted—that the value of the *whole* must be very great indeed. The supply of ore from the mines brought under consideration is equal to a yield of 5700 tons a year."

I have preferred to give the description of the mines in the interesting style of an English mining engineer of undoubted celebrity and reputation, one whose opinion must carry the greatest possible weight with it; but when it is considered that this estimated yield is to be obtained from a part only of the good mines opened, and that there yet remains many to be opened, it is not difficult to see that the above production may be very easily largely increased. My word for it, it only requires the necessary skill and capital to produce an unlimited supply.

Mr. Hitchins says that there is no doubt of 3*l.* 10s. per ton profit being obtained, and I have shown that 5*l.* is made at the present moment. Even this profit may be increased by working up the iron into the forms required *in loco*—there being no other iron establishment for hundreds of miles in all directions, and there can hardly be a competition for an area of over a quarter of a million of miles, which is now all occupied by agriculture, and being covered at a surprising rate with railways. Mr. Hitchins says:—

"These mines, with the smelting works, are, beyond doubt, destined to take a prominent position among the greatest industrial resources of the country, eventually realising a much larger profit than is calculated in this report."

I have said that three years ago there was no railway within 250 miles of this spot, and now, to-day, it is crossed by the great rail (high) way to the East—to the Danube and to the Black Sea. The rivers Bistriza and Moldowa are both in their courses through this property capable of floating the iron the produce of the mines, upon the wood the produce of the soil, at the smallest possible cost, right into the Black Sea. The whole of the East, therefore, is a market open by rail and water carriage to the products of this establishment. Such is the demand for iron in Austria now that railways are delayed in their completion through it. Bridges are topped with wood instead of iron, because of the impossibility of obtaining the necessary "iron construction" in reasonable time, and everything tends, at this moment and for the future, to favour the resuscitation of this for some years neglected iron district. The area, covered by the concessions obtained from the Church and the Government, extends over four German square miles, equal nearly 90 English square miles. The water-power in this area is enormous, and the freehold property counts by thousands of acres of farming land, all rented out, and rising in value every year. The situation is one of the most romantic and really beautiful in the world, and is eminently healthy. The forests are capable of supplying wood at the rate (per estimate) of 170,000 tons per year, which will renew itself for ever.

The present position of the affair in a financial view, and how possession of it may be obtained, is soon told. On the last proprietor committing suicide bankruptcy was declared, and a committee of the creditors have carried on the works ever since, only in order that they shall not fall into disuse. The creditors are—first, a number of mortgagees for small sums, which for the most part are annuities dating a long way back; second, a money institution in Vienna, for loans; third and fourth, the Greek Church Fund and the Government, for money lent and royalty, all *secured;* and, fifth, to Jews for money lent, but *unsecured* by mortgage or otherwise. The whole mounts up to about 100,000*l.* The Government has once put it up for sale by auction, on the valuation of 200,000*l.*, but no offer was made for it. In a very few days now it will be offered for sale again, and this time, in the absence of other purchasers, it is known that the Greek Church Fund Trust will make arrangements with the other three classes of secured creditors, including the Government (who are inclined to make an arrangement of this kind), for a reduction of their demands to the extent of 25 per cent., and buy it for the Church at a total cost of about 650,000 fls., or 55,000*l.* The Trustees of the Church propose to work the establishment *in Regie*, but it is certain that if any *bona fide* offer is made from outsiders to take it off their hands every assistance would be given.

Now for an estimate to bear out my assertion, that this is a "plum to be had for the plucking." On purchasing it for herself the Church

will only be too glad to be able to dispose of it again at the same rate at which she has lent out tens of millions of her funds in all directions, and on all kinds of real estate—that is, at 6 per cent., with amortization for a period of 30 years. Taking this view of the case, and that the 1*l.* sterling equals 12 guilders, we have 6 per cent. on 650,000 fls., a yearly purchase payment for thirty years of a sum of 3250*l.* Mr. Hitchins says that by working *some* of the mines only 5700 tons of iron may be made yearly, and at the profit of 3*l.* 10s. clear per ton; this makes 19,950*l.* Now, the capital required to produce this iron is admitted on all hands to be ample at 20,000*l.* We have then (after paying the first year's instalment of the purchase money) 16,700*l.*, or nearly 85 per cent. on the capital.

Not quite so promising a view is—supposing the Church Trustees pay a higher price at the sale, or for other reasons demand 1,000,000 fls., or 83,333*l.* (this at 6 per cent. is a yearly payment of 5000*l.*), and that the iron should make only two-thirds the profit that is *now actually made*, or 3*l.* 6d. 8d. per ton, under not the best management in the world, and with notoriously stinted means, we shall have 19,000*l.* (less the 5000*l.* payment), or 14,000*l.* to pay on the capital, or exactly 70 per cent. The worst possible view which could be taken is the purchase instalment remaining the same, the production only 3000 tons per year, the capital the same, and the profit the lowest estimate Mr. Hitchins puts on its production—we have a clear 5500*l.* to pay on 20,000*l.*, or 27½ per cent., and one-thirtieth of the value of the works into the bargain.

When I say that, from careful consideration, this last estimate may be increased in the matter of production in a few years four-fold (by retaining a reserve fund) without raising the capital, and that then the profit will be at least what it is to-day, I leave it, Mr. Editor, for your readers to say if I have not made out what I call a plum. I make it 300 per cent. on capital employed, and a property possibly worth 1,000,000*l.* sterling at the end of thirty years in addition. Such enterprises have in England made our iron kings—our Guest's and others; and here is an instance given which will show that for good undertakings the ground is not all covered yet.

Czernowitz, Bukowina, Oct. 29. J. W. WILKINS.

REAL DEL MONTE MINING COMPANY OF MEXICO.

SIR,—An error in figures was made last week in the West India mail news from Mexico in the *Times* newspaper:—

"From Mexico we learn to-day that subscriptions have been opened in Vera Cruz to aid the construction of a railroad to Jalapa. The silver mines of Real del Monte are yielding bounteously. It is estimated that one of these mines has produced $90,000,000 within the last ten years."

The amount produced by that company during the last ten years is about $9,000,000, or 1,500,000*l.* clear profit, or at the rate of 166,000*l.* per annum. H. SEWELL.

Smydde Dyllwan Copper Mines, North Wales.

MINING IN SWEDEN.

SIR,—I have received several letters from parties asking for information relative to the laws and security for mining in this country. At present I have not the time to answer them individually, but, by your permission, I will give a few particulars of the mining laws which I have translated, through your esteemed Journal, which, I trust, will suffice for the present.

Respecting the security for mining, or any other undertaking, there can be no doubt on that point, as the Government do all they possibly can to foster and encourage the introduction of capital into this country, which is much needed; and I believe that when the railways in progress and those contemplated are finished Sweden will see brighter days, as no country, in my opinion, affords better opportunities for speculation than this country does, particularly when one considers the immense deposits of rich iron, and lodes of lead, copper, and zinc, that are lying unworked for the want of capital. Labour and all class of materials required for mining are exceedingly cheap, the single item of the difference in the price of timber alone would be surprising to anyone acquainted with the prices paid in England or Ireland.

The Ammeberg Mines, belonging to the Vieille Montagne Company, are an example of what capital and system can do. The dressing machinery at these mines is second to none other in the world, and well worthy of a visit from those interested in mining. These mines are managed by French and Belgian engineers. I may also remark that the company have built a railway from the mines to Lake Wetteren, a distance of nearly seven English miles, and equally as substantial as the State railways are.

MINING LAWS.—Any one discovering a lode or a deposit of ore has the right of applying for a licence to work the same, provided it is over 100 fathoms from a village or dwelling-houses. The discoverer sends a particular description and situation of the named mineral deposit, name of the village, parish, and also the landowner's name, as well as the county in which the discovery is situated, to the Mining Master, or Government Inspector of Mines, who, after due consideration, issues what is called a "mutsedel" (a grant or licence): for each grant the applicant has to pay 3s. 6d. as fees to the Mining Master. The grant for minerals—iron, copper, lead, or graphite, and iron pyrites—is 100 fathoms; the applicant can have as many as he may wish for. The discoverer within one year of obtaining the licence must commence operations, and perform a certain amount of work, erect buildings, &c. Should the discovery be considered valuable, and worth working, application is made to the Mining Master for laying the boundaries. After the ground claimed has been surveyed and measured, corner stones or stakes are put down to mark the boundaries. The laying of the boundaries, and all particulars connected with it, are read out in the parish church.

THE LANDOWNER'S SHARE IN MINES.—The landowner has the right to take half with the claimant in mining, as well as half the profits, but with the claiming of old abandoned mines, or refuse heaps, the landowner's share is reduced to a fourth, and the other three-fourths belong to the claimant. The landowner may, during the exploring work, provided he announce to the claimant his intention of using his landowner's right, either in full or to any certain part, enjoy the participation in the mining work from the time that announcement was properly made, but with the obligation to acknowledge a corresponding share in all costs requisite for the mine work thereafter; also, in the same proportion, compensate for the value of the necessary and useful buildings, tools, and stones for the work which have before been procured by the claimant; but for the cost that the claimant has had before, for openings and other work for discovering and exposing the mineral deposit, the landowner is not obliged to pay part, whereas the profits of the mine for the same time belong solely to the claimant. If the landowner neglects upon the laying down of the boundaries to give notice of his intention to retain his landowner's right he loses (when no other agreement has been made between him and the mineowner), with the exception stated in the following chapter, his right, no less to the mineral deposit then being worked, than to every other deposit which may afterwards be met with within the boundaries. As to the surface, the mineowner is bound to keep his workings within the area he has had allotted to him, and upon this area he must erect his buildings, make his refuse heaps, and do other things necessary for the mine work; but the mineowner may in addition get assigned to him the necessary roads and sites for such works as are driven with water-power previously. If the mineowner intersects in depth a previously unknown deposit, and will follow the same by a level, it may be done on the condition named in the Royal Mining Laws, even out of the area boundaries, but in this case an unknown deposit is only considered to be in unclaimed ground until the works meet those of another mineowner. The mine or area owner will be obliged thereafter to continue the mine undertaking or work, that at least either blasting for a cubic fathom, or 4 to 5 fms. of exploratory work or mine buildings answering to 200 days' work per year be performed; but these orders do not concern ores in lakes, mine, or slag refuse heaps, which in the meantime must never be left unused or without working for a longer period, at most, than three years.

SUSPENSION OF OPERATIONS.—The right to allow a cessation of the work for a certain time can be obtained when proper reasons are stated. The period of suspension depends altogether on the circumstances of the case, as the law allows from one to ten years, provided proper reasons can be shown for such suspension of the work. The above is merely an extract of the practical clauses of the Royal Mining Laws. At some future day I may give your readers the laws and mining usages in this country. I may remark that it is but seldom the landowner takes part in working mines, as his land occupies his attention, and he generally sells his share of the minerals, often for a small sum. W. HOSKIN.

Sulphur Mines, Norrtelje, Sweden, Oct. 28.

THE TIN AND COPPER LODES OF CORNWALL.

SIR,—In replying to numerous correspondents, asking my opinion whether it is likely that large deposits of tin ore may be found under the immense deposits of copper ore raised from the Old Fortune and other mines on the same lode, situate in the basin of clay-slate or killas formation, schistose, at the base of the surrounding granite hills, from Breage to Lelant and St. Ives, I deem it best to answer the numerous enquiries through the *Mining Journal*.

In the first place, the Old Fortune Mine is situate in the parish of Ludgvan, where operations were first commenced in the year 1720. A series of operations led to discovery after discovery of rich deposits of copper at intervals, extending to the Godolphin Hills, in the parish of Breage, a distance of nearly six miles as the crow flies. The Old Fortune Mine was found in clay-slate, traversed by porphyry, locally termed elvan, at the base of the Ludgvan range of granite Hills. The Godolphin Mines were discovered in similar strata at the foot of the Godolphin chain of hills. A little east of these hills are the Old and present Wheal Vor, from which several millions sterling worth of tin ore has been returned during the last century. The Fortune, Old Prosper, Trewarthen Downs, Kistal, Penberthy Crofts, Ennis Virgin, and Godolphin Mines returned about seven millions sterling worth of copper ore. The two deepest of these mines—the one most easterly, the other at the extreme west—on this lode were wrought to the depth of 150 fms. below the day or adit level.

I have no doubt, from the recent important discoveries in and returns of tin from the debris, or burrows, since the abandonment of these mines for copper, that by extending the operations to a greater depth—say, 100 fms. deeper—immense deposits of tin will be found; and when the granite is reached similar deposits to those in Dolcoath and adjoining mines will be met with. But to re-open these old and extensive range of mines not less than a million sterling may be required, and I doubt that the landowner will meet capitalists in this or even the next generation upon such terms as to justify capital being sunk in such a speculation; and until the price of copper and tin is double what it now is it will never be done, as new countries offer a much greater inducement to men of capital, and concessions of large mineral tracts of land are constantly being obtained at a trifling sum. In fact, land is now frequently given to capitalists to induce them to populate distant countries, many of which abound in minerals on and near the surface. A. BENNETT.

Nov. 2.

MINING IN THE NORTH OF CORNWALL—No. I.

SIR,—From a desire to promote the development of the mineral wealth of our own country in preference to lavishing capital on foreign speculation, I offer a few remarks on the minerals of the northern coast of Cornwall, which have long been neglected. Readers of the *Mining Journal* are aware that mining in Cornwall is decidedly improving, as evinced by the number of old mines resumed, such as Crenver and Wheal Abraham, the Glew Consolidated, the Virtuous Lady, Old Treburgett, and many others, and also that mining enterprise is steadily progressing in and towards this district.

In the cliffs all the way down the Bristol Channel may be seen beds of slate, veins of quartz, and lodes running inland. Numerous large caverns have been excavated by the sea acting on and destroying lodes of rich mineral. In particular may be noted the cavern under the peninsula at Tintagel, the roof of which in some parts is composed of a thin layer of malachite. The legend of the coinage in King Arthur's Castle, at Tintagel, of silver from the virgin metal is supported by the rich ore now found in the adjacent mine of Treburgett. In a neighbouring cliff also the late Captain Verran discovered a silver lode, known as Wheal Samson, from which he made a large sum, one lump realising several hundred pounds. Lower down the coast, in the parish of Endellion, are the old rich antimony lodes, and as the value of that metal has of late increased they will probably be re-worked.

Lead abounds in the neighbourhood of Padstow, promising lodes of which may be seen in the cliffs, particularly at Stepper Point, and about Trevose Head and Pentre Point. Near here, at the Old Pentire Glaze Lead Mine, was raised some of the finest carbonates of lead ever found in England. Near St. Merryn Church Town may be seen some rubbish heaps from small trials made many years ago upon a lead lode, but never developed. In this parish lead has been occasionally turned up by the plough, but hitherto this mineral has been grossly neglected in this district. Over the border, higher up the coast, is found the celebrated Comb-Martin Silver Mine. Camden, writing of this mine, says:—

"The first fynding and the working of which there are no certain records remayninge. In the tyme of Edward ye First they were wrought, but in the tumultuous raigne of his son they might chance be forgotten, until his nephew, Edward ye Third, who in the French Conquest made good use of them, and so did Henry ye Fifth; and lately in our age, in the tyme of Queen Elizabeth, there was found a new lode in the lande of Richard Roberts, gentleman, first began to be wrought by Mr. Adrian Gilbert, and after by Sir Richard Beavis Bulmer, Knight, by whose myneral skill great quantitie of silver was landed and refined, of which he gave a rich and fayer cup to the Right Hon. William Earl of Bathe."

Another cup was presented to Sir R. Martin, Knight, Lord Mayor of London, inscribed and dated 1593. This cup is now used annually at the civic feast on Lord Mayor's Day. Here, as in the majority of mines, the works have been stopped by a cross-course intersecting the lode, when they are usually abandoned for the benefit of more enterprising successors. OBSERVER.

SILVER MINING—A NEGLECTED NEVADA AT HOME.

SIR,—It seems strange and unaccountable that a district offering such riches to the miner as the North of Cornwall, the Minver and the St. Teath portion of it especially, should have been so long neglected. One cause of this neglect may, perhaps, be traced to the habit so prevalent among the promoters of mining undertakings of attaching themselves to positions where some lucrative mine has already been opened. If a Caradon, Seton, or Chiverton, or some other such luminary, has shone forth in the mining empyrean, forthwith these gentlemen revolve around it, with the persistency of planets around the sun, and Caradons, Setons, and Chivertons spring up instanter on all sides, east, west, north, and south, on lodes presumably the same, or parallel or transverse, as the case may be, and the public are led to believe that all are going to prove equally profitable. In the meantime, through the dust and excitement stirred up by this means, it cannot be doubted that many a district abounding in mineral wealth, such as would bring large returns of profit, if fairly worked, are passed over with unmerited neglect. There is, perhaps, no more striking instance of such neglect than is afforded by the portion of Cornwall above named.

And what makes it the more striking is the fact that mines have been opened there in past times which have made large returns in the shape of dividends, and that, too, at a time when, through ignorance of the wealth they possessed, scarcely more than one-tenth of the harvest of profit was obtained that might have been realised.

Old Treburgett is a remarkable instance of this; for, besides the large amount of silver existing in the lead ore, it has been discovered since the mine ceased to be worked that throughout the extent of the lode there exists in its capels, or casings, *a pure silver ore*, apart and distinct from the lead. I mention this mine, which is now about to be re-opened, simply as an instance of the mineral wealth of this portion of Cornwall. I believe it requires but a pioneer company, such as this, to demonstrate how rich in minerals—*in silver especially*—this part of the county is. It cannot be doubted that there is here a wide field for profitable mining operations. For there are, no doubt, other lodes of equal richness to be discovered. I feel confident that we shall see this district of Cornwall full of mining activity in a few years time, and that the mining public will be greatly indebted to those who are now leading the way.

The importance of this district has not escaped notice. A letter appeared in the *Mining Journal* of March 13, entitled "The Future of Cornish Mines," urgently directing attention to it, and especially to its rich promise in silver; and yet so resolutely do mining operators keep to old grooves, that little or no account seems to have been taken of the evidence and advice therein given by one, it would seem, well acquainted with this district, destined ere long to become, perhaps, a miniature Nevada in the mining world. T. L.

OLD TREBURGETT MINING COMPANY.

SIR,—The announcement in last Saturday's Journal that a subscription for shares is now being invited to set Old Treburgett at work again has put our village quite astir. I trust now we shall no longer have to lament the want of enterprise to unwater and work a mine with such an acknowledged high reputation. It is firmly believed by all in the neighbourhood that the mine will a second time, not only regain its former repute for silver-lead, but also yield greater wealth than before, from its rich silver ore, previously not made available.

As a few historical facts may not be uninteresting to your readers, I crave space to relate them. Old Treburgett was last worked about thirty years ago, for lead only, which averaged 30 ozs. of silver to the ton. Since the mine stopped, it has been discovered that the quartz side-walls of the lode contained *true silver ore, distinct and separate from the lead*, and such parts of the capels as were taken down were thrown away on the burrows. The capels being very hard, permission was given the parish authorities to use the same in mending the roads and in making hedges. Only fancy, true silver ore worth 30*l.* a ton, ground to powder and mud by agricultural wagon-wheels!! It is almost incredible, but it is a fact, nevertheless. For the most part the capels are still standing in the mine below the adit, but since the discovery of the silver ore the backs above the adit level have been taken away, the burrows turned over, and even the hedges pulled down for the hitherto neglected wealth. A large sum of money was realised therefrom by simply sending the rough ore, just as it was, to the smelters, and averaged in that state 30*l.* a ton.

The Treburgett lode is running about north-east and south-west, and the sett is about 400 fms. in length on the course of the lode. At the south-west end of the sett the mine was first worked to about 35 fms. deep, making good-paying returns, when in sinking a shaft about 150 fms. north-east on the lode, they cut a splendid course of lead ore, within 2 fms. from grass, from whence great quantities of lead were sent to surface for 2*s.* 6d. per ton. This course of ore making north, the engine was removed to about the centre of the sett, still keeping the water under at the old shaft by means of flat-rods, but in going down the water came quicker, and they were obliged to stop the old shaft. The mine was then worked to the depth of 60 fathoms. A shaft was also sunk within a few fathoms of the north-east extremity of this sett about 17 fms. deep, and, in driving, cut a kindly lode of white iron and lead. The water being so very quick after cutting this lode, they were obliged to discontinue the flat-rods from this shaft, and shortly after the small engine was overpowered with water from the bottom of the mine; and at the same time a disagreement having arisen among the adventurers, the mine was stopped. It now remains for the present proposed company to vigorously set to work and take advantage of the shaft and levels made by the former proprietors, thereby saving time and money.

In conclusion, I cannot help wishing that a few gentlemen with a little capital would visit this neighbourhood, and explore the many inviting lodes that I could show them. I may especially mention one, an acknowledged true silver-bearing lode, as laid down by the Government Geological Survey Map of the district. It is situated on the sea coast at Bound's Cliff, and some rich stones of silver ore have lately been broken there, specimens of which I send you, and also some from Old Treburgett, to show anyone interested in the subject, in the hope that they may interest investors to visit our parish, and explore the lodes in the neighbourhood, as being situated so out of the way of travellers in general, our mineral riches have hitherto been neglected. WM. W. PHILP.

St. Teath, Cornwall, Nov. 2.

WEST CARADON, AND ITS MANAGEMENT.

SIR,—It is the obvious duty of each shareholder to attend the forthcoming general meeting, for it is clear that the heavy call which we are called upon to pay every time we are convened together brings about a greater loss. Surely we have seen enough of the utter fallacy of continuing the expensive deep workings. We were told that by sinking the shaft to the 180 we should cut two important lodes. The shaft was sunk, at an enormous outlay, when Capt. Rich, of Great North Downs, was called in by the committee to advise as to the mode of procedure. Capt. Rich at once saw that the junction could be more readily and inexpensively proved by sinking a winze from the 170 than by driving the cross-cut, as by the former plan the point could be tested in two months, while the latter would take at least twelve. Again, our manager recommended the continuance of the 170, whereas a practical authority of great eminence, who has recently minutely inspected the mine, has no hesitation in stating that if everything with regard to the value of the lode is realised, the ground is so short *that its working could not possibly pay the water charges*. If this really be the case, it is certainly reflective upon the practical skill of those to whom we have so long entrusted the management of our affairs.

As there is no prospect of the mine ever paying in depth, and as we have a considerable amount of really valuable shallow ground unexplored—remembering, too, that it was only from the shallow levels our dividends were realised—which is the sticking point with our executive, actuating them thus pertinaciously to continue operations, which, for the reasons above stated must, even under the most favourable circumstances, result in a loss.

This, and other material questions, should be fully discussed at the meeting, and some more satisfactory course of operations agreed upon, by which we may hope to realise some permanent advantage from the shallow ground.

Nov. 2. A CORNISH SHAREHOLDER.

MINING IN DEVON—TAVISTOCK DISTRICT.

SIR,—It must be gratifying to see the cordial interest taken by the most respectable and experienced mine agents, and their determination, in so far as they legitimately can, to countenance only those concerns which will bear the strictest investigation, and when we see the promoters of a mine soliciting the opinions of such men as a guide to their operations it is a good omen. Had this been done years gone by how many more good mines should we not have of which to boast? If we look around the neighbourhood of Tavistock we can see one of the first fields for mining in the two counties—scarcely a mine in the neighbourhood having had anything like a fair trial but has returned, and is returning, large quantities of ore, amongst which are Old Gunnislake, Hingston Down, Bedford United, Gawton United, Okel Tor, Devon and Cornwall United, Devon Great Consols, Crelake, Gunnislake (Clitters), Hawkmoor, and Old Wheal Friendship, which latter for sixty years or more has been sending large quantities of ore into the market, and with large profits, most of the time. There are many such still left to be taken up and worked, from which large profits will be won, whenever the necessary amount of capital can be brought to bear thereon.

Adjoining Old Wheal Friendship to the north is OLD WHEAL BETSY LEAD MINE, for many years a marvel of prosperity. It still continues to raise lead, and will again, no doubt, now that more energy is being applied, soon resume its old position as one of the leading and most productive lead mines of the day. The adjoining ground to the north shows one of the finest and richest looking gossan lodes that can be seen, and every indication that can be found in Old Wheal Betsy is to be met with here. The lode is all exposed to view for many fathoms in length, and it is believed by all who have seen it that it is scarcely a speculation. No doubt this will shortly have the proper attention paid to it which it deserves.

HAREWOOD CONSOLS.—Passing near this, I saw operations were commenced, and walked into the works. A lode of more than the usual good appearances has been opened on; it is somewhere about 8 ft. wide, of gossan principally, with the accompaniment of capel, mundic, &c., and the channel of ground exceedingly congenial to the production of large quantities of mineral. An engine-shaft, which can be sunk cheaply, and a steam-engine, for pumping and haulage of stuff, will be at once commenced. The shaft will be deepened as expeditiously as possible, no time being lost in trying what the mine is to be. This is a good legitimate speculation, and no doubt it will be rewarded with good results from the mine.

Mining is fast becoming, and must become, a favourite investment with the public, who cannot reap so great advantages from any other speculation as from legitimate mining.

DEVON GREAT CONSOLS, of course, has seen its best days, but when we consider its vast returns, its immense dividends, and its having paid considerably more than a million sterling in twenty-five years, how can it be expected it can do much more? Let the shareholders be content, and show their gratitude by assisting to open other mines, some of which in the neighbourhood offer equally promising results, although they may be on a somewhat smaller scale. There are many points where operations can be commenced with equal confidence as to good results, and it behoves all who can to aid the legitimate outlay of capital, and to condemn at once anything to the contrary. CORRESPONDENT.

[For remainder of Original Correspondence, see this day's Journal.]

TECHNICAL EDUCATION.—The first part of the "British and Foreign Mechanic," which has just been issued, contains an enormous mass of really valuable information. Mr. E. H. Todé, whose long connection with technical literature is a sufficient guarantee for his ability to provide for the wants and suit the tastes of those for whom the work is intended, has displayed even more than his usual energy in conducting the periodical, and furnishes instruction for working men in such a form that there need henceforth be no complaint that the continental workman has greater facilities for the acquisition of knowledge of a sound practical character than those of our own country. The work will form handsome volumes for the workman's library, and if he study them they will repay him a hundredfold the cost and time expended upon them. The "British and Foreign Mechanic" deserves large and continued success.

FOREIGN MINING AND METALLURGY.

The price of coal has not varied materially in Belgium since our last report; some qualities are, however, a good deal sought after, and display a certain advance. The sale of coke has been increasing of late at Liege; the condition of the collieries of the Liege basin has also sensibly improved. Prices have presented great firmness at Liege. Tables in illustration of the commercial movement from Belgium during the first seven months of this year have just appeared; they show an increase of 45,685 tons in the exports of rails, as compared with the corresponding period of last year. Annexed are further details as to the exports of rails from Belgium during the first seven months of the last three years:—

Destination.	1869.	1868.	1867.
Russia.....Tons	35,543	28,415	51,565
Zollverein	3,183	3,858	11
Hanse Towns	—	106	147
Low Countries	1,971	1,077	2,342
England	1,010	3	25
France	476	236	223
Spain	36	15	53
Switzerland	30	1,134	—
Italy	10,359	3,530	5,434
Turkey	27,278	—	—
United States	5,928	206	—
Rio de la Plata	220	—	—
Other countries	2,225	—	—
Total	84,259	38,574	59,805

It is not only as regards rails that an increase in the exports is remarked, but rolled iron also presents favourable results. Thus in the first seven months of 1867, 31,143 tons of rolled iron were exported from Belgium, while in the corresponding period of 1868 this total amounted to 39,878 tons, and in the corresponding period of this year to 47,404 tons, showing an increase of 7526 tons in the first seven months of this year. The exports of plates in the first seven months of the last three years present the following equally favourable results:— Destination.

Destination.	1869.	1868.	1867.
Russia.....Tons	836	513	369
Zollverein	2,907	1,294	1,384
Hanse Towns	108	34	79
Low Countries	2,218	1,041	1,409
England	8	109	41
France	5,621	4,097	4,033
Italy	39	2	2
Switzerland	674	343	303
United States	—	—	57
Brazil	—	—	—
Other countries	104	120	9
Total	12,515	7,553	7,686

The increase observable this year in the exports is considerable, amounting, it will be seen, to about 5000 tons. The whole of the exports of pig, castings, rails, iron, and works in iron, amounted for the first seven months of this year to 165,508 tons, against 107,929 tons in the corresponding period of 1868, and 118,099 tons in the corresponding period of 1867. The imports of iron minerals into Belgium in the first seven months of this year amounted to 319,468 tons, against 220,653 tons in the corresponding period of 1868, and 158,194 tons in the corresponding period of 1867. The Great Central Belgian Railway Company has just placed some Bessemer steel rails on its line, the spot selected being the Lodelinsart incline, near Charleroi; this is the first application which has been made in Belgium of Bessemer steel rails on an ordinary piece of line, unconnected with a station yard, or any spot where a good deal of shunting is carried on. The steel rails thus laid down on the Lodelinsart incline were furnished by the Barrow Hematite Steel Company (England) at 11*l.* 18*s.* 5*d.* per ton, on trucks at Antwerp; the rails are guaranteed for seven years. To give an idea of the importance of this guarantee we may state that three years since some special iron rails were made for the incline; these rails were of the first quality, and cost 8*l.* 8*s.* per ton; but notwithstanding all the care brought to bear upon their manufacture, at the end of three years they were completely destroyed. These details conclusively establish the utility of steel rails on certain parts of a railway—a utility now recognised and admitted by the principal French railway companies, which have used steel rails at exceptional points of their networks for more than a year past.

The aspect of the Prussian metallurgical markets since the commencement of this year has been satisfactory. The stagnation from which affairs suffered last year has disappeared, and the sale of metallurgical products has acquired such proportions that prices have experienced a remarkable advance. Some enterprises, which had been postponed to periods assumed to be more propitious and convenient have been attacked with vigour; great industrials confiding in peace have entered upon affairs with courage. The demand for rough pig and iron displays a good deal of firmness in Prussia, and prices have only slightly varied of late. Stocks of pig are disappearing, and the production is run off without difficulty, although considerable quantities of rough iron are imported into Prussia from Luxembourg, Belgium, and Scotland. The demand for merchants' iron in Prussia continues excellent, orders arrive at some of the works in such great abundance that operations are carried on unceasingly, day and night. The railway companies have materially contributed to the demand for merchants' iron and castings, thanks to the construction of new lines and the extension of old ones; the rolling mills devoted to the production of rails have been working with their full force. As regards the contracts for rails and plant, recently let by Prussian railway companies, we may note that the Niederschlesisch and Markisch has ordered 3800 tons of iron rails and 1900 tons of cast-steel rails. The Westphalian has ordered 13,000 fish-plates, 160,000 cramps, 40,000 bolts, and 2600 tons of rails. The Upper Silesian has ordered 5335 tons of cast-steel rails, 2865 tons of iron rails, and a further quantity of 15 miles of iron rails. The Eastern of Prussia has ordered 279 miles of rails, divided into two lots. The Upper Silesian has ordered for its Posen, Thorn, and Bromberg line 7000 tons of iron rails. Metallurgical industry is developing itself in the province of Hanover, after passing through rather a long period of stagnation. The engine manufactory of Dr. Strousberg, at Linden, near Hanover, gave the first impulse to the iron trade of the district; this manufactory, although it has been greatly extended of late, is in full activity. Dr. Strougsberg is understood to have received a large order for locomotives on American account. The Neustaedter Hutte, which some years since suspended operations, is now again in working; the production of pig and cast-steel is about to be commenced at the Salzgitter and Osnabruck establishments. The Hutte of Ilsede, the Hanover foundries, and the George-Marie Hutte establishments, which some time since had to struggle with very great difficulties, hope now to obtain a sufficient amount of profit. The net profit realised by the George-Marie Hutte for 1868-9 was 57,600*l.*, and the dividend will probably be at the rate of 10 per cent. per annum. The Phœnix Company for Working Mines, Blast-Furnaces, and Iron Works, at Laar, near Ruhrort, acquired for 1868-9 the great profit of 160,000*l.* The council of administration of the company proposes to reserve out of this sum 64,000*l.* for the construction of a new establishment to be devoted to the production of steel. It is doubtful, however, whether the shareholders will give their consent to this arrangement, as many of them are for absorbing the whole profits realised in the payment of dividends.

The general state of the French metallurgical groups continues satisfactory, and everything leads to anticipations of a good winter season. Several of the works are overdone with orders; for instance, the Froncles rolling-mill is overdone in this manner with orders for plates. In the Haute-Marne iron continues in good demand. Rough pig almost makes default; 4*l.* 10*s.* per ton has to be paid for charcoal-made; mixed pig is dealt in at 3*l.* 8*s.* to 3*l.* 12*s.* per ton. Machine iron is a good deal sought after in the Haute-Marne, but the production suffers a good deal from want of water; it is, then, very natural that a quotation of 8*l.* 16*s.* per ton should be accepted for No. 20 coke-made. Work is abundant in all the foundries of the Haute-Marne.

The Vienna Chemical and Metallurgical Products Company has just held an ordinary general meeting. The balance available for distribution in respect to the past year's working was returned at 36,572*l.* A large proportion of this sum was applied to the formation of a reserve fund, and 1000*l.* was carried to the profit and loss account. A sum of 12,000*l.* was, however, devoted to the payment of a dividend on the shares at the rate of 12 per cent. per annum. The New Schottland Mining and Metallurgical Company at Horst, near Steele, pays a dividend for the past year at the rate of 6 per cent. per annum. The revenue of the Parisian General Company for Lighting and Heating by Gas increased in September to the extent of 7667*l.*, or 8·11 per cent., as compared with September, 1868. For the nine months ending Sept. 30, this year, the increase as compared with the corresponding period of 1868 was 69,845*l.*, or 8·01 per cent.

FOREIGN MINES.

ST. JOHN DEL REY.—Morro Velho, Sept. 29: Morro Velho produce, second division of September, 12 days, 3351 oits.; yield, 2·239 oits. per ton. Gabiroba produce for the above period, 243 oits.; yield, 1·373 oits. per ton. Remittance received, 21,099 oits.—202 7-10 lbs. troy.—New Shafts: Shaft A sunk during September, 4 fms.; shaft B sunk during September, 4 fms. 1 ft. 6 in. Rock firm and sound.

DON PEDRO (Gold).—Remittance, 28,556 oits. Water continues to increase, and only with great difficulty are we enabled to break even a very little stuff from the stopes in "curve." From southern extremity of same, at horizon of Vivian's shaft, box work has been taken out. Advance has been made in sinking, and in the sump-shaft we have a lode giving fair strake work. The canoa in the underlie lode continues to give first-class general work, and at times some sufficiently rich for boxes. Stoping is being carried on vigorously in the new lode; as yet no line has been encountered. I am pleased to report arrival of remaining portions of the horse-engine; every effort will be made to get this at work with as little delay as possible to ease the water in the stopes. At Treloar's level the ground continues bad, but we are making a little progress on side one. So anxious am I to get this most important section pushed on that I have offered a premium of 20*l.* to the men if they succeed in mastering the bad channel. Vivian's shaft is now timbered to the dip of the lode, about 80 fms. from surface, and some part of this month the whim will go to work. Nothing has been done at the deep adit since my last, and seeing the great difficulties we are experiencing and have experienced in driving adits south of the lode, I have had careful surveys made, and find that south-east of Lagoa Secco adits can be driven not having to cross the bad channels we have met with in the shallow, middle, and deep adits, and Treloar's level. Produce weighed to date, 11,388 oits.; estimate for September, about 12,000 oits.

ANGLO-BRAZILIAN (Gold).—Remittance, 6138 oits. General operations have progressed, force has improved, and sick list has been favourable. The feature of the mine continues promising. At Foster's west we have holed to the Fundao, and let down an enormous quantity of water. The lodes brought to light are very large, in some places 18 ft. in height, but the old excavation is very much crushed, and too dangerous to work in, so we shall work on the lodes by communications deeper from Foster's, and get beyond the crushed ground.

ROSSA GRANDE (Gold).—Remittance, 2178 oits.—Mine: No change has taken place at the western exploration of Gongo since my last advice. The disordered state of the vein extends for a greater distance than first anticipated, and as yet no sign is visible of its recovery. At Mina de Serra nothing new worthy of remark has occurred at the points of operation, but I am glad to say that the general appearance of the lode in this mine is more encouraging now than I have ever seen it before.

GENERAL BRAZILIAN (Gold).—Since my report for last month the operations here have progressed satisfactorily. A detailed account of the same will appear in my monthly report. The weather continues remarkably fine for surface operations, and every nerve is being strained to get as much as possible done before the wet season sets in.

TAQUARIL (Gold).—T. S. Treloar, Sept. 29: Since my last more timber has been brought in, enabling us to continue sinking and securing the engine-shaft below the shallow adit. At the deep adit a favourable change has taken place; better duty, therefore, is being performed. In Rouse's level but little is being done, most of the hands having been removed to the wheel-pit. At the latter place the walls for supporting the wheel are progressing satisfactorily. The senzalas are nearly completed, some doors, windows, and beds only remaining to be made. Capt. Treloar was here on Sept. 25. He examined our works, and expressed himself highly pleased with the progress made. Seeing that the excavation for the wheel race is a much heavier job than expected, owing to the soft nature of the ground, and fearing that the wet season will begin early, and be very severe after such an unusual drought, he advised the concentration of the force upon the wheel-pit and all other out-door works. His advice I need scarcely say was immediately attended to, but even so he concurred with me that it is very problematical whether the pumping machinery will be erected by the time he expected. Apart from the difficulty above referred to, as to the wheel pit, we are short of timber, and short of iron work for the water-wheel; we shall, therefore, have to make it (the latter) here. I have only to add that I left feeling more and more sanguine of the company's success.

SAO VICENTE.—W. A. Treloar: Since my last Capt. Treloar, the consulting engineer, has visited this establishment and examined our works. I am pleased to say he expressed himself highly satisfied with everything done since his last visit. He, however, found the appearance so bad at Phillips's shaft (quartz formation) that he advised the cessation of all works at this point. He further advised the examination of Humphrey's Mine, which is also in the eastern section, as it can be done at a comparatively trifling expense; and if nothing is found here he then advises the examination of Morro das Almas Mine. I need not add his advice will be attended to.—Jacotinga Formation: The present operations now in progress for exploring the jacotinga formation will, at the advice of Capt. Treloar, be continued as far as practicable. At present we have to suspend those at the shaft on top of the mountain, on account of water. No. 3 cross-cut has been very hard almost all the month, but is again much easier; and if it continue we shall, I hope, extend rapidly into the mountain.

PESTARENA UNITED GOLD.—The directors have received the following telegram, dated Pallanza, Nov. 3:—Pestarena United Mines produce for October, 650 ozs. of gold.

RHENISH CONSOLS.—G. Sweet, Wiehl, Oct. 28: Christiania: The cross-cut driving south from the bottom of the engine-shaft has been extended 1·5 lachters, but has as yet not reached the footwall of the lode. The driving west in the 20 lachter level is poor. The lode in the adit end, driving west, is of a very favourable appearance, and will afford 12 centners of lead ore per lachter. A stope in the roof of the 20 lachter level, and east of cross-cut, will afford 1¾ ton of lead ore per lachter. A stope in the roof of this level, and 5 lachters west of cross-cut, will afford 1¼ ton of lead ore per lachter. A stope 15 lachters west of cross-cut will afford 2 tons per lachter. A stope in the roof of the adit level will afford 1¼ ton per lachter.—Bliebach: The lode in the winze sinking on the north lode, from the bottom of the adit level, and 30 lachters west of air-shaft, will afford 1 ton of lead ore per lachter. A rise from the roof of the 10, to communicate with the above winze, will also afford 1 ton per lachter. The lode in the stope in bottom of the 10 lachter level will afford 25 centners of lead ore per lachter. A stope in the roof of this level will also afford 25 centners of lead ore per lachter. A stope in the roof of the adit level, and west of air-shaft, will afford 14 centners of lead ore per lachter. We have during this last month experienced a great want of hands, caused by the miners drawing up their potatoes, &c., which has affected our returns; but now that is finished we hope in future to do better. We have again a good supply of water for pumping purposes, which will greatly reduce our coal expenditure.—Estimated returns for October: Lead ores, 460 centners=1380 thalers; blende, 50 centners =50 thalers: total, 1430—total cost on mines, 1500 thalers: deficit, 70 thalers.—Madonna: The new or Reed's shaft is now down to the bottom of the old workings. The lode in the shaft, and in the bottom of the old level, which has been cleared out some 3 or 4 lachters, is of a very favourable character, and affording splendid lead ore, about 2 tons of which have been brought to surface during this month. We shall commence directly to stope the bottom of the old level. The steam-engine is being erected on the first or Sweet's shaft, and will, I hope, be ready to work by Monday next, so we are looking forward to have a good pile of ore to sell at this mine by the end of November. Our prospects at this mine are very encouraging.

IMPERIAL SILVER QUARRIES.—L. Chalmers, Oct. 11: Fifteen feet of tunnel were made last week.

WEST CANADA.—Capt. F. Williams, Oct. 12: Huron Copper Bay: The stope in the bottom of the 20, east of Stephens's winze, is slightly improved of late, and yields 2½ tons of ore per fathom. The stope below the 20, west of Palmer's shaft, yields over 2 tons of ore per fathom. The stope in the bottom of the 20, east of Palmer's shaft, yields 3½ tons of ore per fathom. The stope in the bottom of the 35 east yields over 3 tons per fathom. The lode in this stope is from 16 to 18 ft. in width at the point we are now working, but it gets narrower as we approach Bray's shaft, and the yield appears much the same as at present. The stope east and west of Powell's winze, on the Fire lode, is not changed since last reported on, and still yields 2½ tons of ore per fathom. We have not been able to do anything towards driving the level through the arch at this point for this take, owing to the shortness of staff in our dressing-floor; but we hope to proceed with it again in November. The stope over the 35, east of Bray's, yields 3 tons of ore per fathom. The stope in the bottom of the 35, east of this shaft, is worth over 3 tons of ore per fathom. The lode in this stope is 16 ft. wide near the winze, but appears to get narrower further east. The lode in the 60, west of Bray's engine-shaft still looks well, and yields nearly 2 tons of ore per fathom. The lode in this level appears to be improving every foot we drive through, and we are beginning to think that we shall find a good lode in Palmer's shaft when the lode is stripped down that is standing to the north and south of the shaft. We are still engaged in cutting the plat at Bray's 60, and I am happy to say that in taking down a piece of ground standing to the south of the shaft we happened to cut the south part of the lode, which appears to be wide, and also contains some good work. We shall be able to say more about the value of the lode at this point after it is cut through.—Wellington Mine: The stope east of Rowe's shaft looks well, and yields over 3½ tons of ore per fathom. The stope west of this shaft yields over 3 tons per fathom. We shipped, on the 8th inst., per Acadia, 1348 barrels of ore. We expect the vessel here again on Nov. 1, and we are doing our best to get a full cargo for her.

[For remainder of Foreign Mines see to day's Journal.]

AUSTRALIAN MINES.

AUSTRALIAN UNITED (Gold).—Mr. Kitto, Fryerstown, Sept. 11: Duke of Cornwall Mine: The necessary timber for the completion of the braces, tramways, &c., only arrived on Saturday last, the 4th inst., and although the buddles will be fixed in a few days, it will be impossible to treat the pyrites until the Chilian mills are fixed for grinding the roasted ores. I have determined, therefore, to commence on Monday, the 13th inst., to crush such of the ores as leave the smallest proportion of pyrites, in order that as little loss as possible may result, and at the same time our revenue be supplemented by the gold produced.—Central Mine: The engine started pumping successfully on Thursday, the 9th inst., and Capt. Holman has just reported that he anticipates commencing to sink on Monday, the 13th.—Machinery: Mr. Rowe reports the whole of the machinery to be in splendid working order, which statement I endorse. The captain of the Duke of Cornwall Mine reports, on the 11th Sept., to Mr. Kitto, as follows:—"Daukes's shaft is now complete to the 200 ft. level. We have commenced to open out, and shall with all speed force this level on to Cattle's lode, distant about 80 ft., but through hard rock.—East Cross-Cut: We have struck some small veins of quartz since my last, and there is a great quantity of water coming out, which strongly indicates that we are not far from the main lode. In this cross-cut we are now 100 ft. east of Cattle's lode.—West Cross-Cut: Not much improved since my last. This level is 117 ft. west of shaft.—Stopes (Daukes's): We commenced these stopes soon after my last report. We have a great quantity of quartz broken, but I would recommend not to crush any of this quartz until we have our buddles in working order, as there is a large quantity of pyrites in it, and my experience in California teaches me that the saving of it is of the utmost importance.—East Cross-Cut (Old Shaft) 80 fm. Level: We have struck a small vein of quartz, but not of much value; I expect we shall meet with several more before we cut Ferron's lode.—Stopes, 80 feet Level: We have also a great quantity of quartz broken from these stopes. I should recommend crushing this quartz at once, as it is but slightly charged with the sulphurets.—Lamb's Shaft is now 110 feet from surface. Since my last we have gone through a large body of quartz. We intend to sink 40 ft. more before opening out.—Remarks: After a long delay, I am glad to state we have completed our tramways from Daukes's shaft to the batteries, and also the skip-road in shaft. I trust in a short time to have our buddles in full working order. All other works are going on quite satisfactorily."

YUDANAMUTANA COPPER.—The directors have received advices from their superintendent dated Adelaide, Aug. 11 and Sept. 13, respectively. Under the former date he writes—"With regard to the Port Augusta Railway, the inspectors have completed their survey, and their tender is now before the House for consideration. Mr. Wallace, the principal inspector, has been at our office, and appears certain of great success to the line when completed.—Sept. 13: Smelting: In this department everything is progressing satisfactorily. Our traction-engine is now doing excellent service, a much larger quantity of stuff being hauled than was before done by the whim in the same time. Wood is coming in very fast.—Port Augusta Railway: Leave has been granted to bring in a Bill increasing the 5 per cent. guarantee to 6 per cent., and it is generally rumoured that Government will support it. The mine is steadily improving, and I hope to report by next mail that our wages at the mine have been settled at a considerably lower rate." Capt. Terrell reports, under date Aug. 9—"Blinman Mine: Since my last report we have completed timbering down the main shaft, after which I put the men to drive north of the shaft, and this week they have cut a very good lode of ore, about 18 in. wide. This is quite a distinct lode at our deepest level, and running into whole ground, which confirms my opinion that there are larger deposits of ore north than already seen. Ore raised in the month, 419 tons; smelted, 419 tons; copper made, 43 tons 14 cwts.—Blinman Mine, Sept. 4: I mentioned last month that we cut a branch of ore north of the main shaft; the branch still holds good, about 18 in. wide; this place will make good stopes of ore.—No. 3 Winze: The men who have been sinking and stoping above the 25 fathom level have holed, and I have put them to sink on the same branch that they followed down; the branch is about 1 ft. wide, solid ore. Ore raised in the month, 410 tons; smelted, 410 tons; copper made, 46 tons.

PORT PHILLIP AND COLONIAL (Gold).—Mr. Bland, Clunes, Sept. 10: The quartz crushed during the four weeks of August was 5066 tons, yielding 1269 ozs. 7 dwts. of gold, or an average per ton of 5 dwts. The receipts were 4863*l.* 12*s.* 6*d.*; payments, 4521*l.* 16*s.* 2*d.*: profit, 341*l.* 16*s.* 4*d.*; added to which was last month's balance of 48*l.* 3*s.* 6*d.*, thereby making an available balance of 389*l.* 19*s.* 10*d.*, which was carried forward to next month's account, being too small to divide. The following is the return for the first two weeks of September:—Quartz crushed, 2523 tons; pyrites treated, 67¾ tons: total gold obtained, 920 ozs. 11 dwts., or an average per ton, including pyrites gold, of 7 dwts. 7 grs. The third week of September gave 1200 tons of quartz crushed, but the yield of gold had not been ascertained. In consequence of no division of profits having been made, no remittance has been received.

WORTHING.—T. Prisk, Aug. 13: The 93 fm. level north end continues in a good lode, all the size of the end; distance driven from the cross-course north about 12 fms. This has been driven on an average of about 5*l.* per fm. The 93 south is in about 7 fathoms, a splendid lode all through. The width we cannot tell, having no wall, but ore all around—back, bottom, and sides; this level is in about 7 fms., and has been driven for about 3*l.* per fathom. We have a rise going up on the back of the 93 for ventilation; it is not so good as the average of the lode in driving. We have also three winzes sinking, one south and two north, in the bottom of the 83 fm. level, each in a good lode, and when holed will open out for us good paying stopes, and also ventilate the 93 fm. level. In the 63, north of the long rise, the lode has turned out well up to the present time, but is now small to what it has been, still yielding good paying work. In the 73 south we have cut a large stream of water, and what would be called in the old country the capels of the lode, with spots of ore, but enough has not yet been done to say what it is. At present, I am happy to say, the mine is looking well, and promises better for the future. The two calciners have been at work all the month. Number of hands employed, 129.

— J. Prisk, Sept. 9: The south end of the 93 is not so good as last reported, but still a strong lode continues in the end, but at present hard for driving; the ground driven in this end for the month ending Aug. 21 was 8 fms. 2 ft. by two men, price for driving on the average about 3*l.* per fathom; the level is driven 7 ft. by 4 ft., and will yield for every fathom driven 6 tons of ore; the lode from wall to wall, after being stripped, is about 11 ft. wide, and the greater part of it is ore of good quality. The north end in the 93 has been driven through a good lode of ore; the lode is not so wide as in the south, but continues good, and is now driving at 5*l.* per fathom, 7 ft. by 4 ft.; this end is driven north of the cross-cut 14 fathoms through a good lode most of the way. We have sunk a winze through from the 83 to the 93, which has well ventilated the level, and also opened up two good stopes, which we have let—one at 2*l.* per fathom, and the other at 2*l.* 10*s.* per fathom. We have commenced to drive on a caunter branch; it is about 2 ft. wide, and will nearly pay cost for driving; it is running about due north. Should this turn out to be good it will greatly add to the value of the property. We are rising on the back of the 93 south for air, and to open up stopes. Also sinking a winze to hole to the 93, north of the present end, both are yielding a good quantity of ore. The 63 fm. level end, north of Pedler's rise, has been driven through a lode of ore up to the present time, and we have now met with a flookan, which has for the time disordered the lode, but I have no doubt we shall meet with the lode all right in a fathom or two driving, as we have got the same thing at the 83, and the lode going on in its proper course. We are sinking a winze in the bottom of this level to ventilate the 93 fm. level north; as soon as this is done we shall have some good stopes opened up north, having 40 fathoms of backs to beat away. The lode in the winze is paying well for sinking; price, 9*l.* per fathom; so that when we come to stope this ground we shall be able to make a profit. The 73 fathom level north is close on holing to Nankeros's stopes, south of Pedler's rise; so soon as this undertaking is completed, we shall be able to go on stoping the back, which will help our returns. This month will nearly finish the stopes in the backs of the 73 and the 83 fathom levels south. The shaftmen are now about to commence sinking for the 103, which, we hope, if the ground holds good, to reach in about six months. Quantity of ore raised during the month, 300 tons. Number of hands employed, 138.

ENGLISH AND AUSTRALIAN (Copper).—Port Adelaide, Sept. 13: The quantity of coal on hand was 438 tons. Two furnaces were at work at Port Adelaide; the refinery had been let out for repairs. Since date of last advices 200 tons of copper had been shipped.

SCOTTISH AUSTRALIAN.—The directors have received advices from the general superintendent at Sydney, dated September 8, with report from the Lambton Colliery to September 5. The sales of coal for the month of August amounted to 12,797 tons.

AUSTRALIAN MINING COMPANY.—Advices received by the directors report that the land adjoining the company's estate at Tungkillo had been proclaimed a gold district by the South Australian Government, also that gold in cement had been found on the estate itself two days before the departure of the mail, on Sept. 13.

GERALDINE MINE (Western Australia).—The reports from Capt. Mitchell, the manager, still continue of a most favourable nature. He reports having raised during the four months up to Sept. 4, 325 tons. All parts of the mine were looking well, yielding from 2 tons up to 7 tons per fathom of fine galena. Up to the latest advices he had ready for shipment about 700 tons, exclusive of 125 tons lately shipped. This mine is now in good working order, and likely to prove most valuable to the proprietors.

YORKE PENINSULA.—By the mail just arrived the directors have received despatches from the committee for two months, bringing intelligence from Adelaide and the Kurilla Mine to Sept. 9 last. The following are extracts from Capt. Anthony's reports:—"Aug. 12: Hall's engine-shaft is sunk 1 fathom below the 35 fm. level; the lode is 10 ft. wide, composed of slate, quartz, felspar, mundic, and yellow copper ore, and in sinking a very decided improvement is taking place, not only in the increasing quantity of higher class ore, but in its general characteristics. The slate is a lighter colour, and softer, there is more and clearer quartz, and ten times the quantity of felspar. · · · · I have to inform you that I have removed the timbering from a portion of Deeble's shaft (30 fathoms west of Hall's), and I find green muriate of copper, mixed with as fine statchettine (mineral tallow) as I have ever seen, and forming a most promising lode. The place from which the ore is taken is about 8 fathoms from the surface. I may add that a fine surface deposit of ore was found at the mouth of this shaft, but it does not appear that the lode on which Hall's shaft is sunk was discovered. · · · · This place should be vigorously laid open. It would be considered a good prospect in our richest mines."—"Sept. 9: During the past four weeks I have sunk 1 fathom in Hall's shaft, making it 37 fathoms deep from surface. The ground has been of the most difficult nature for sinking in; it affords me much pleasure, however, to inform you that the worst in this respect is over, as the ground is now easier for sinking. The lode continues to improve, and considering the very short distance sunk, the improvement is very great; there are occasional good stones of yellow ore, with good prospects of increased quantity in sinking deeper. I cleared up Deeble's shaft 10 fms. 2 feet deep from the surface; the lode in the bottom of the shaft is yielding much water. I have driven a level at 8 fathoms from the surface (in dry ground), and 3 fathoms to the westward; the lode is from 2 to 5 wide, with more or less green ore throughout. During the last two days I have raised 1 ton of green ore of 12 to 15 per cent., and the lode, which cannot be surpassed in all the characteristics of a splendid mineral vein, is still improving in its yield of higher class ore. The engine and pitwork are working in the most satisfactory manner."

CORNISH PUMPING ENGINES.—The number of pumping-engines reported for Sept. is 20. They have consumed 1158 tons of coal, and lifted 7·5 million tons of water 10 fms. high. The average duty of the whole is, therefore, 44,300,000 lbs., lifted 1 ft. high, by the consumption of 112 lbs. of coal. The following engines have exceeded the average duty:—

Cargoll Mines—Michell's 72 in.	Millions	49·5
Cook's Kitchen—50 in.		47·3
Dolcoath—Harrictt's 60 in.		46·5
Great North Downs—Sleggan's 70 in.		66·2
North Wheal Crofty—Trevenson's 80 in.		53·5
Providence Mines—40 in.		52·2
South Wheal Frances—Marriott's 75 in.		56·5
West Chiverton—Hawke's 80 in.		52·8
West Wheal Seton—Harvey's 85 in.		61·5
Wheal Seton—Tregonning's 70 in.		67·2

LONDON GENERAL OMNIBUS COMPANY.—The traffic receipts for the week ending Oct. 31 was 9088*l.* 15*s.* 5*d.*

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